CALIFORNIA HIGH-SPEED RAIL AUTHORITY

November 1, 2012

RISK MANAGEMENT PROGRAM
Overview and Coming Attractions

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California High Speed Rail Authority

JON TAPPING, PE, RISK MANAGER
CALIFORNIA HIGH SPEED RAIL AUTHORITY

- Transportation program management career spanning over 29 years.
- Management positions in project management, design, maintenance, and mega-project construction.
- Most recently the Risk Manager for the $6.3 billion seismic retrofit of the San Francisco-Oakland Bay Bridge Project (SFOBB), reporting to Toll Bridge Program Oversight Committee.
- Independently managed the refinement, implementation, and maintenance of an improved and enhanced SFOBB risk management program. The SFOBB project is projected to finish under the budget approved by the Legislature over six years ago.

RISK MANAGEMENT PROGRAM -- CREDIBILITY

California State Auditor
Bureau of State Audits

LAO
65 YEARS OF SERVICE

TOLL BRIDGE PROGRAM OVERSIGHT COMMITTEE
CALTRANS BAY AREA TOLL AUTHORITY CALIFORNIA TRANSPORTATION COMMISSION

Caltrans

BAY AREA TOLL AUTHORITY

STATE OF CALIFORNIA
CALIFORNIA TRANSPORTATION COMMISSION

TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

PRESENTATION OUTLINE

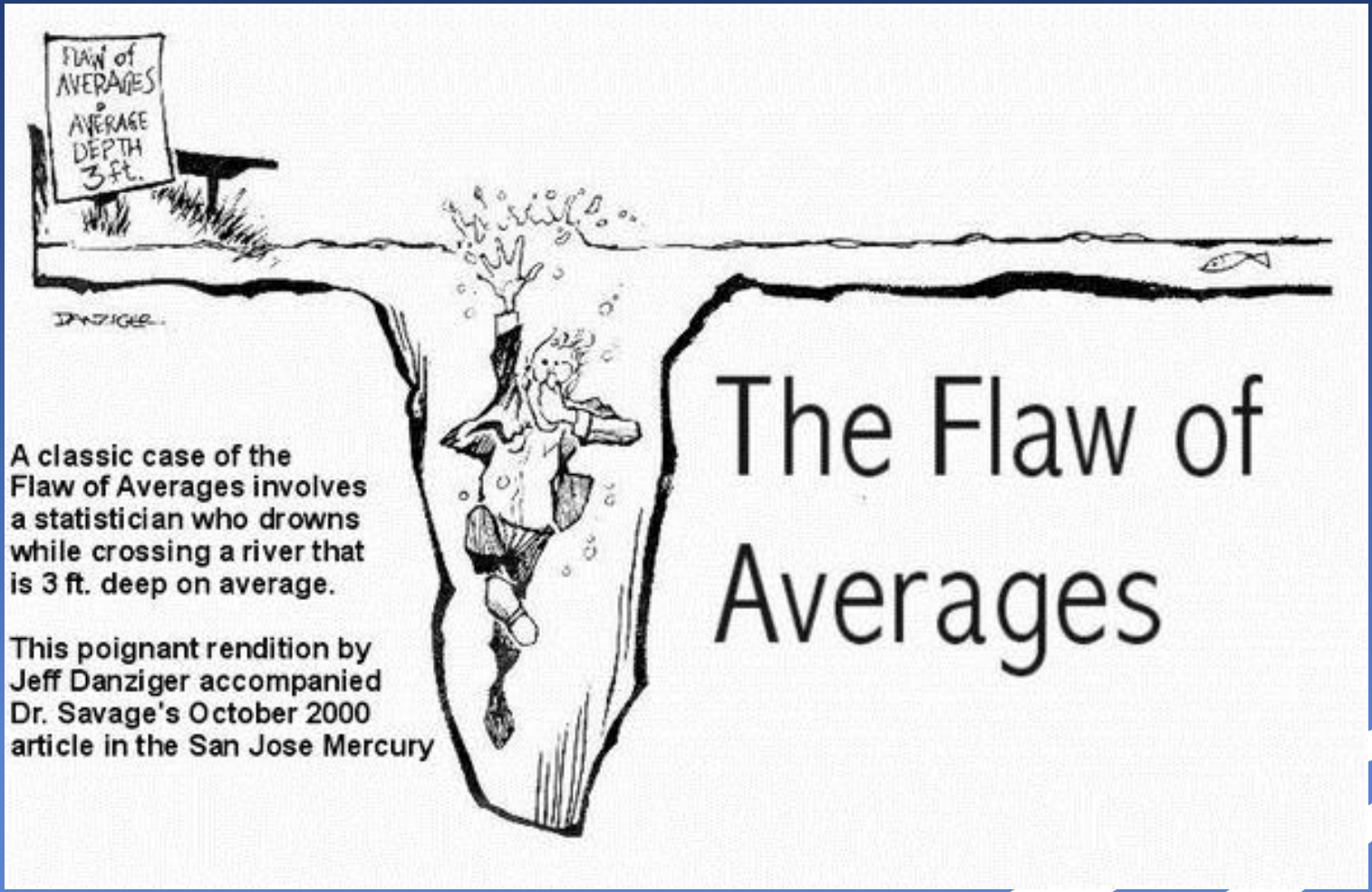
CHSRA Risk Management Program -- Overview and Coming Attractions

- Statutory Risk Management Requirements
- The Value of Comprehensive Risk Management
- CHSRA Risk Management Planning and Implementation
- The Power of Quantitative Risk Management
- Challenges and Successes
- CHSRA Risk-based Decisions
- CHSRA Risk Management Coming Attractions

RISK MANAGEMENT -- STATUTORY REPORTING REQUIREMENTS (SB 1029)

- "A comprehensive risk management plan that defines roles and responsibilities for risk management and addresses the process by which the authority will identify and quantify project risks, implement and track risk response activities, and monitor and control risks throughout the duration of each project."
- "Quantification of the effect of identified risks in financial terms."
- "Development documents to track identified risks and related mitigation steps."
- "Plans for regularly updating its estimates of capital and support costs."
- "Plans for regularly reassessing its reserves for potential claims and unknown risks, incorporating information related to risks identified and quantified through its risk assessment processes."
- "Plans for regularly integrating estimates for capital, support costs, and contingency reserves in required reports."

“WHAT DOES A RISK MANAGER DO DADDY?”



VALUE OF RISK MANAGEMENT

- Transparency -- Legislature and stakeholders understand, accept , and value risk management results and advice
- Contributes to project success:
  - Senior management recognizes uncertainty – more informed budget and schedule decisions
  - Take actions to increase the opportunities for project success
  - Innovative risk mitigation
- More informed decision-making:
  - Saves money (more than cost of implementing risk management)
  - Supports and documents appropriate funding requests
  - Avoids public embarrassment
- Forward-thinking problem solving

RISK MANAGEMENT CYCLE

How to approach, plan and execute the risk management activities

Determine risks which might affect the project, and their characteristics (probability, impact)

Prioritize risks for subsequent further analysis or action

Analyze numerically ($, time) the effect of risks on project objectives

Develop options and actions to reduce threats and enhance opportunities

Track identified risks, monitor residual risks, identify new risks, execute risk response actions

IMPLEMENTING COMPREHENSIVE RISK MANAGEMENT

IMPLEMENTATION

RISK MANAGEMENT PLAN

California High-Speed Train Project

FLYCALIFORNIA
Without ever leaving the ground.

CHSTP Risk Management Plan

for inclusion in the
PMT Program Management Plan

Prepared by: Noel R Berry — 12 Mar 10 Date

Checked by: Joe O'Carroll — 12 Mar 10 Date

Approved by: Ken Jong, Engineering Manager — 12 Mar 10 Date

Released by: Anthony Daniels, Program Director — 19 Mar 10 Date

Revision	Date	Description
0	12 Mar 10	Initial

Note: Signatures for latest technical memorandum revision as noted above.

Framework

Prepared by PB

for the California High-Speed Rail Authority

Updated RMP is fully compliant with SB 1029 and BSA recommendations

GETTING STARTED – RISK REGISTER

Led by an experienced risk manager

Facilitated Risk Workshops

ONLY forum where the focus is on

- Keep it simple
- Stay within the team's comfort zone

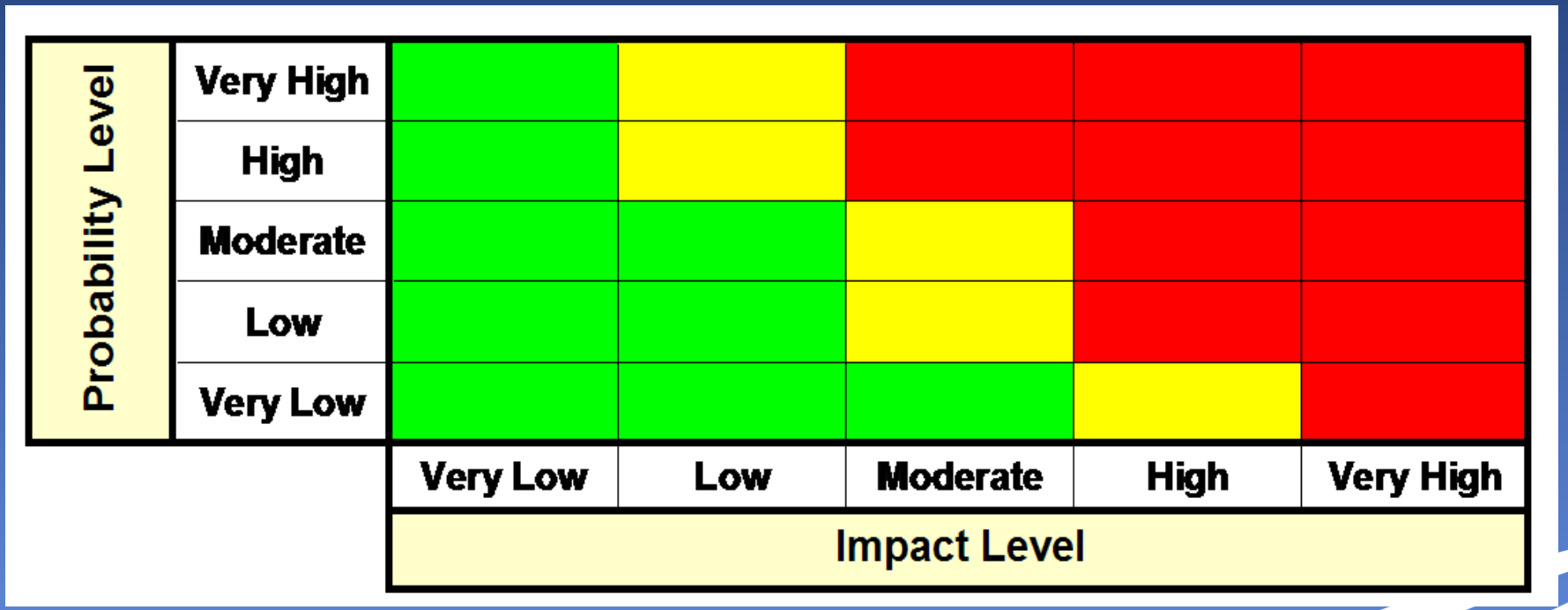
QUALITATIVE RISK ANALYSIS

QUALITATIVE ASSESSMENT CRITERIA

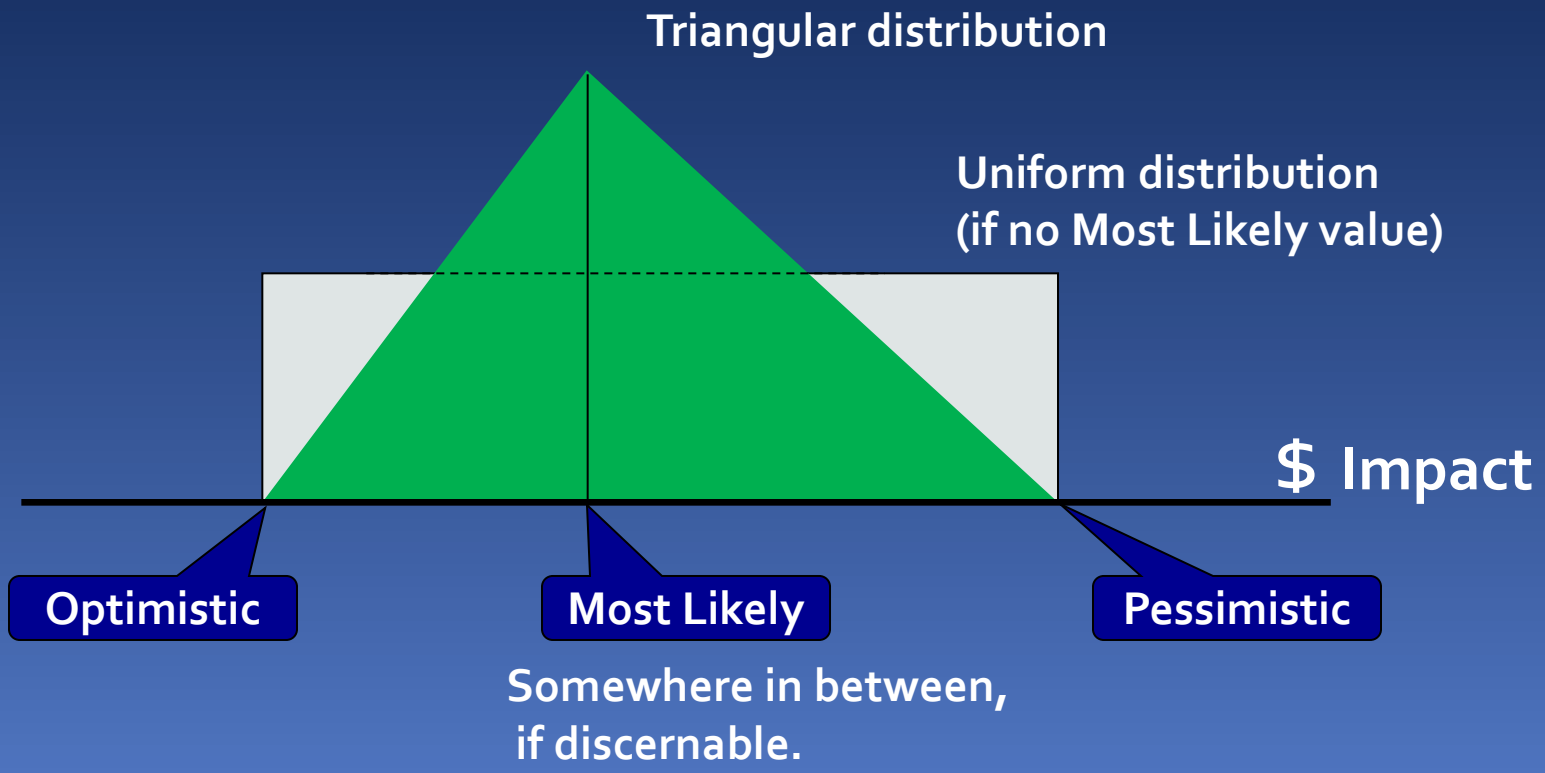
Priority	Description
Very High	Any risk that threatens the region's ability to meet one or more of the region's triple constraint parameters of scope, schedule and resources to such an extent as to put funding or wider program in jeopardy
High	Noticeable and inconvenient effect on the Region's objectives necessitating significant project re-planning involving PMT and/or Authority
Medium	Region's scope, schedule or cost objectives can be met, but project re-planning may be necessary
Low	Any risk that can be dealt with within the Project Team and would have no anticipated long-term effects
Very Low	Any risk that can be handled within a monthly status cycle and would likely not be visible outside the Project Team

QUALITATIVE RISK ANALYSIS

Risk = Probability x Impact

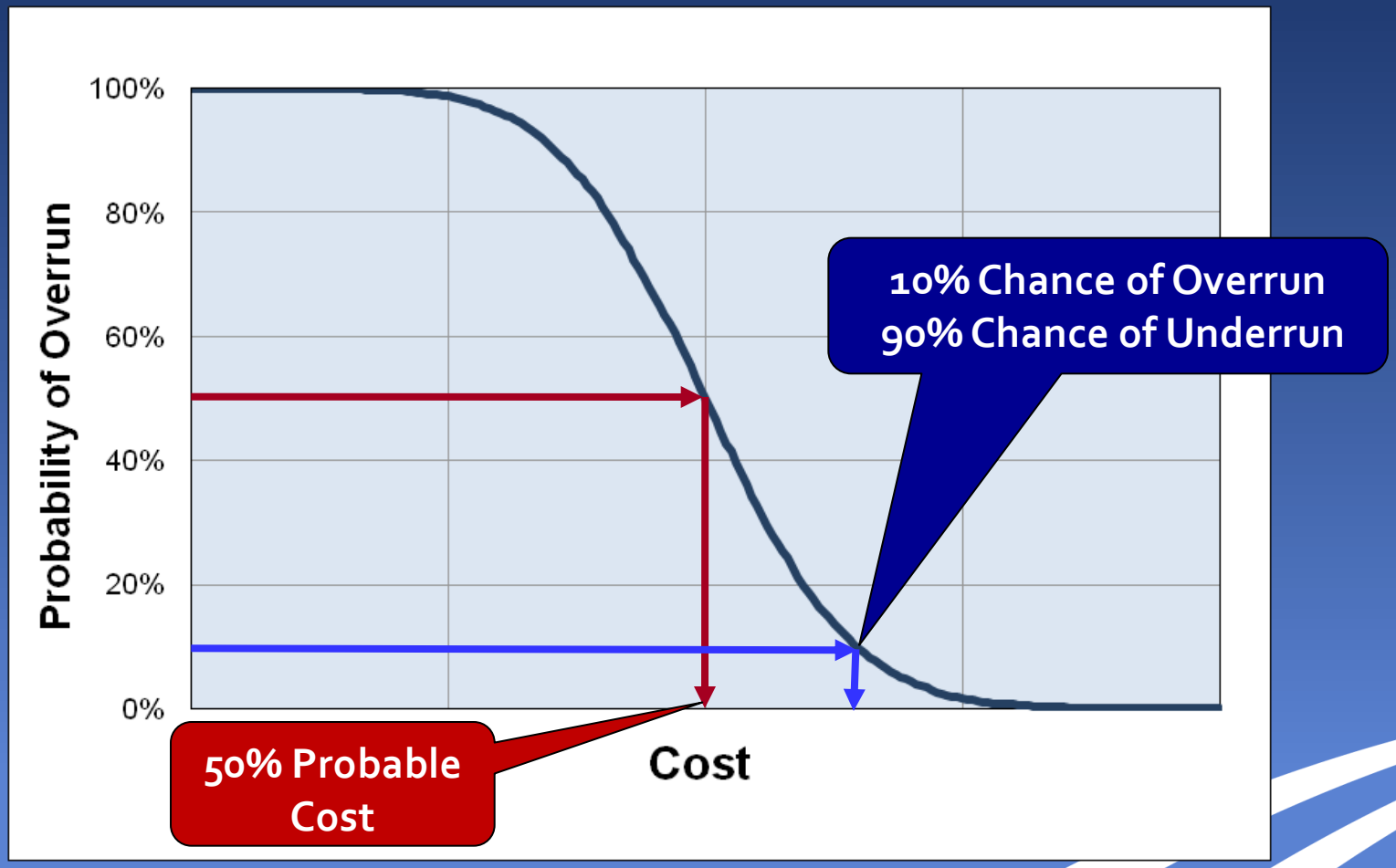


QUANTITATIVE COST RISK ANALYSIS



- Keep it simple
- Stay within the team's comfort zone

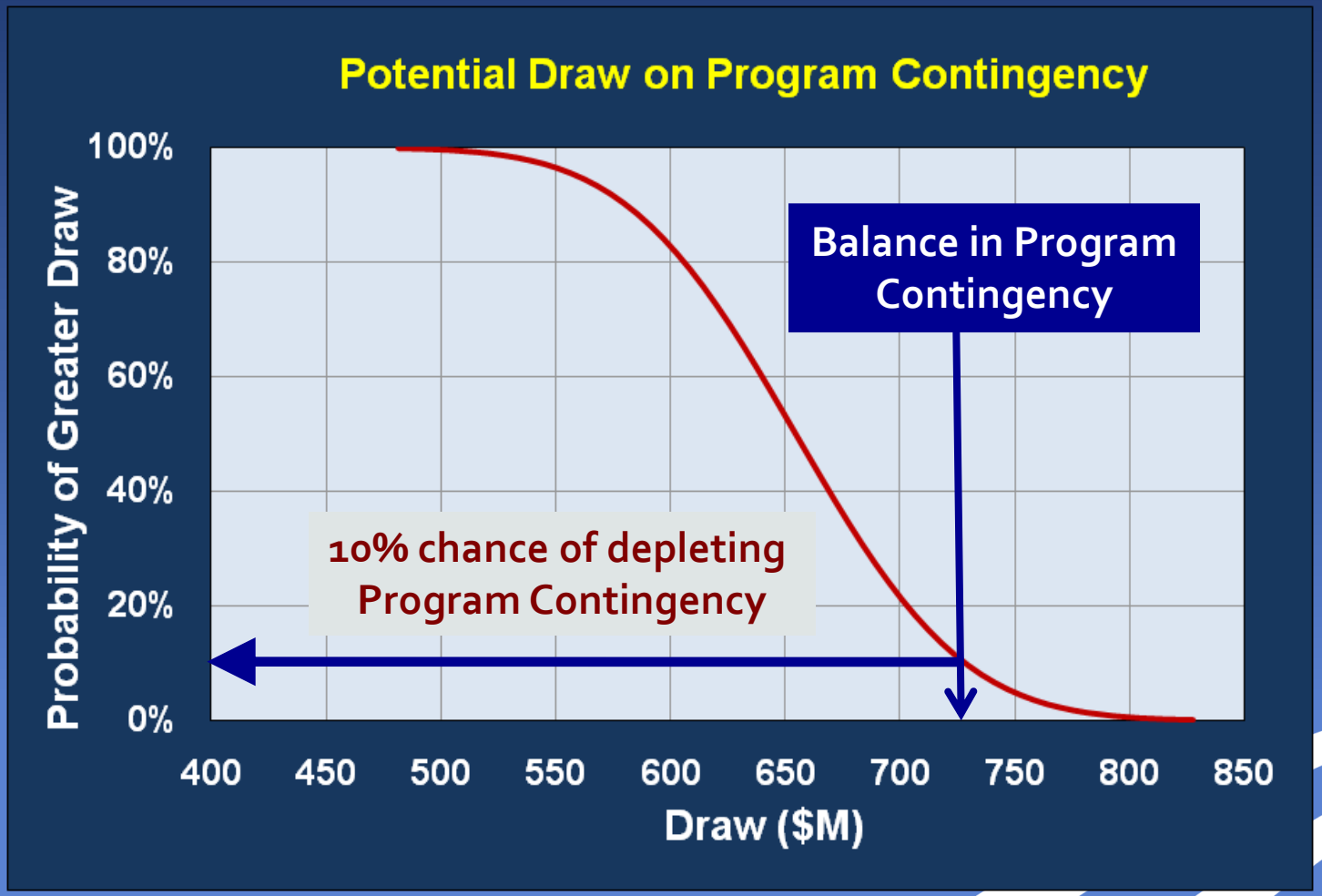
COST PROBABILITY CURVE



COST PROBABILITY CURVE APPLICATION

-- illustrative

"Adequacy of Program Reserves"



VALIDATE CONTINGENCY

-- During Preliminary Engineering Phase (illustrative)

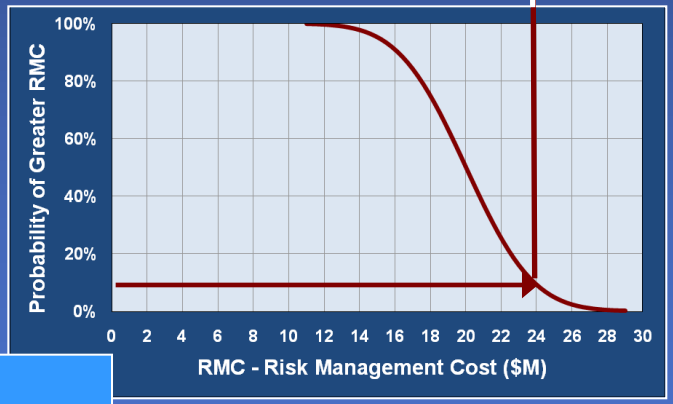
"Conventional" Approach

Contingency (Usually a %)

Additional Contingency

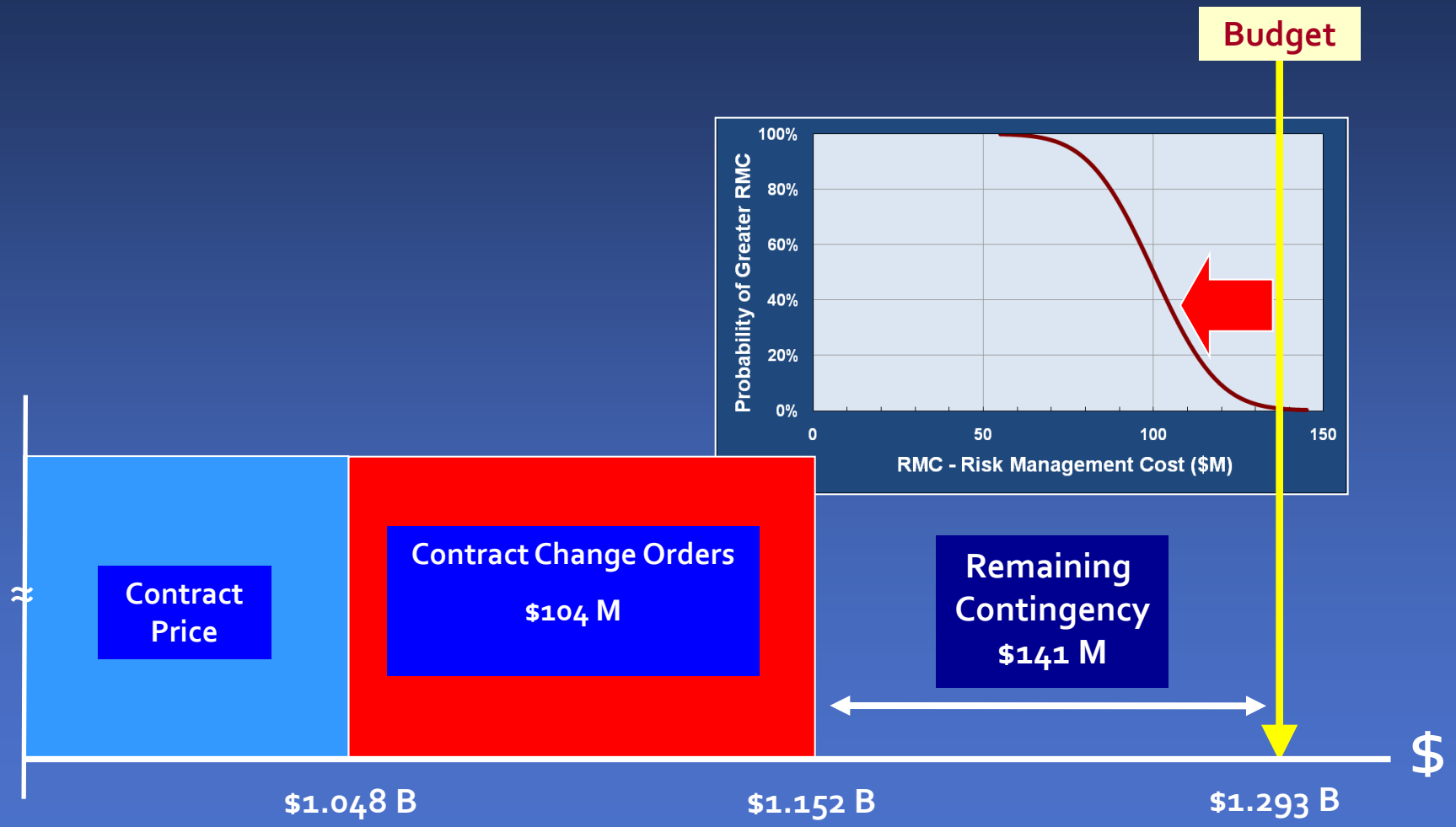
Contract Price Estimate

Risk Management Approach



Contract Price Estimate

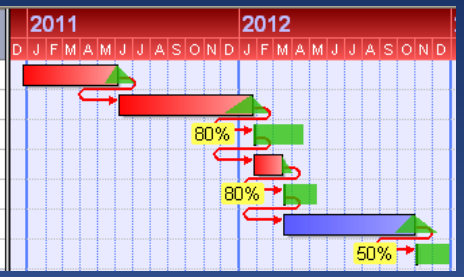
FORECAST AND BUDGET ANALYSIS
-- During Design-Build-Operate Phase (illustrative)



SCHEDULE RISK ANALYSIS

-- illustrative

ID	Description	Rem Duration
000831	Erect Cable System Temporary Works	167
000341	PWS System Installation	232
SAS R180A	**Problems with PWS Installation**	**0**
000351	Load Transfer Cable to Deck Sect.	52
SAS R180B	**Problems in Load Transfer**	**0**
000941	Complete Cable system	230
SAS R180C	**Delays in Cable System Completion**	**0**



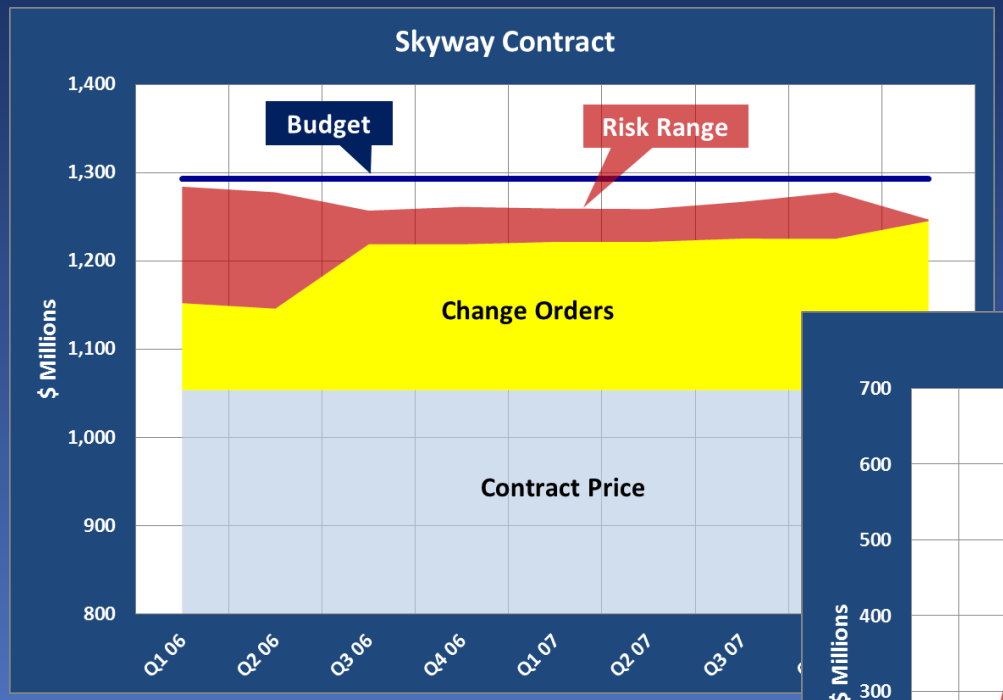
Min Duration	Most Likely	Max Duration	Probability %
140	167	200	
180	232	260	
0		**90**	**80%**
50	52	70	
0		**60**	**80%**
190	230	270	
0		**60**	**50%**

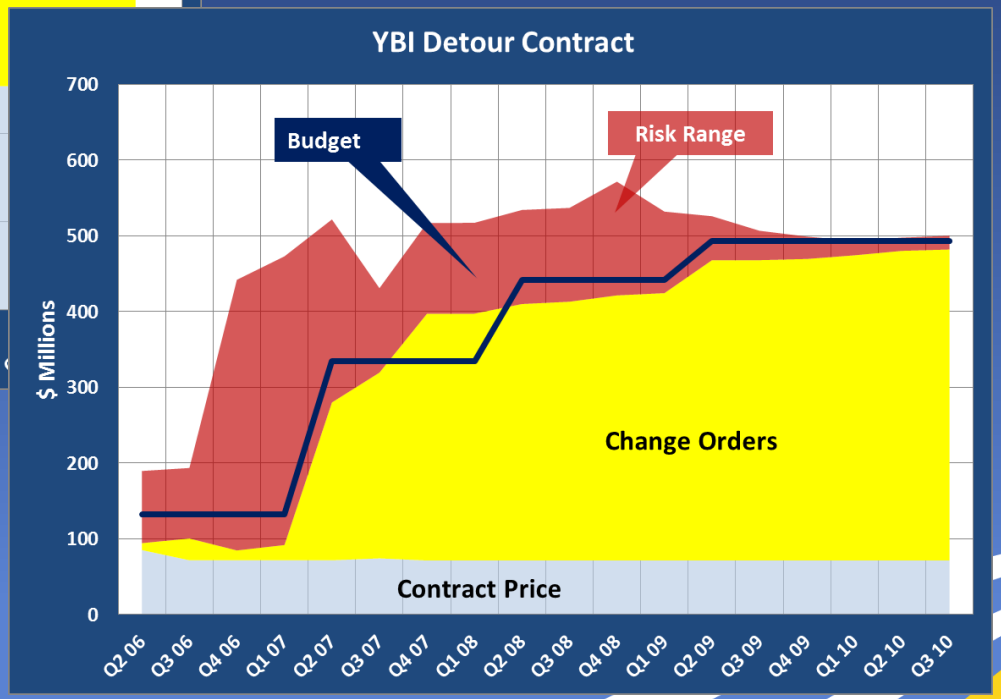
- Keep it simple
- Stay within the Team's comfort zone

→ **Cost of Delay Risk in Risk Register**

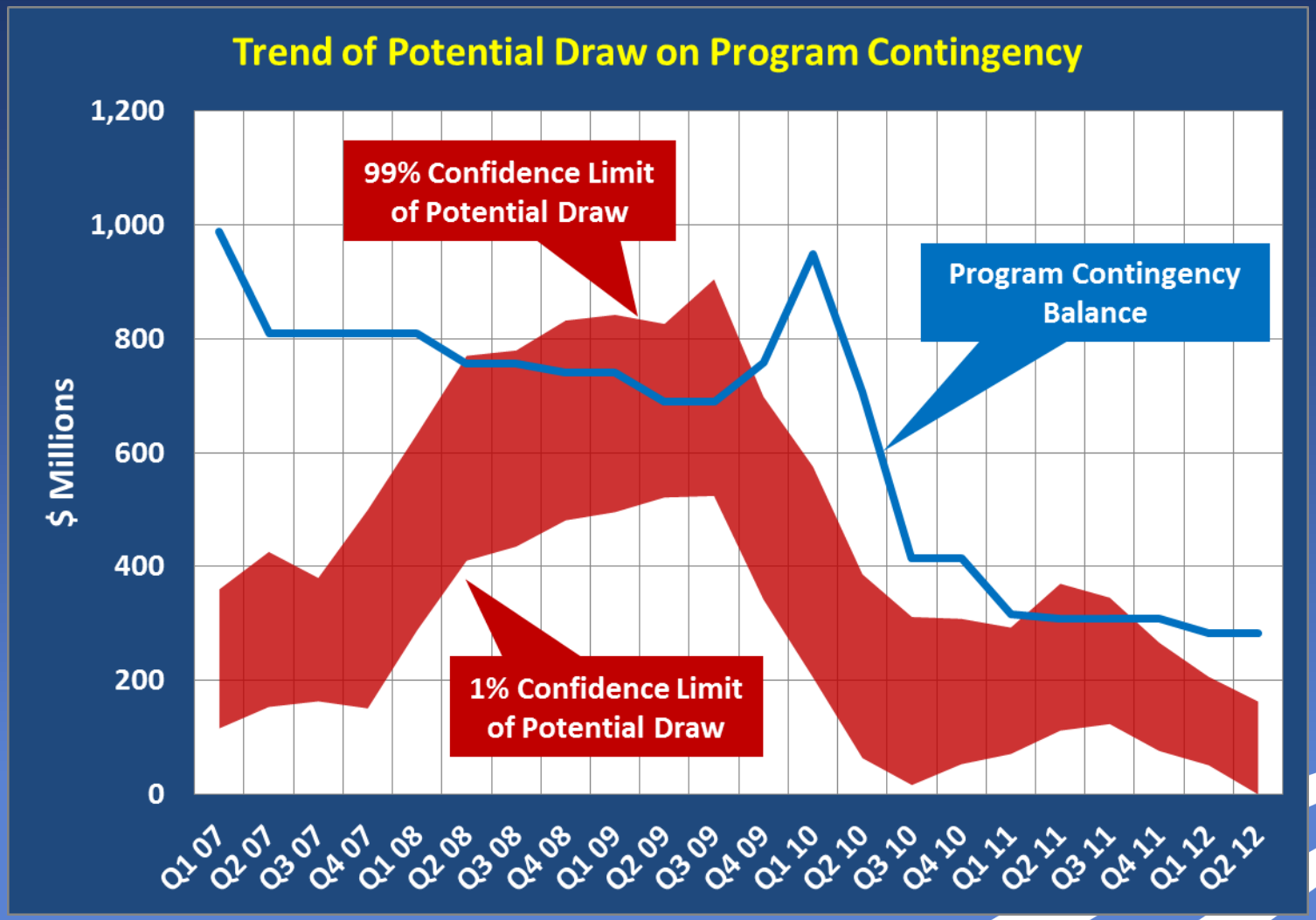
RISK MANAGEMENT WORKS

-- illustrative



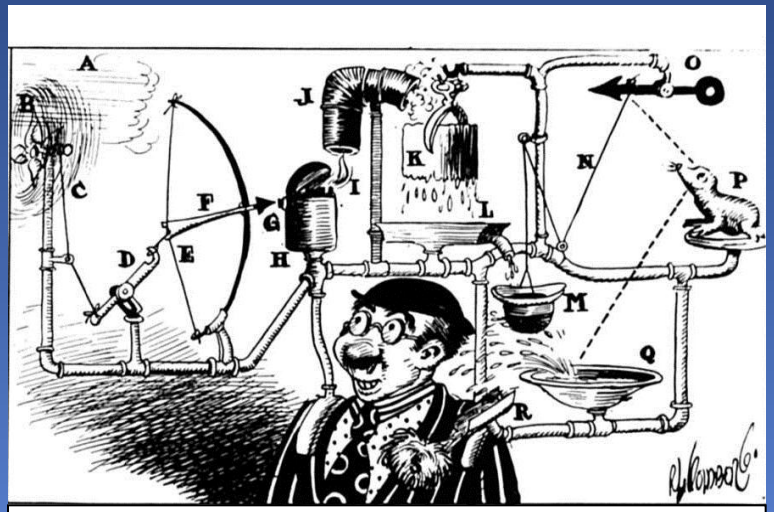


RISK MANAGEMENT WORKS
-- illustrative



CHALLENGES

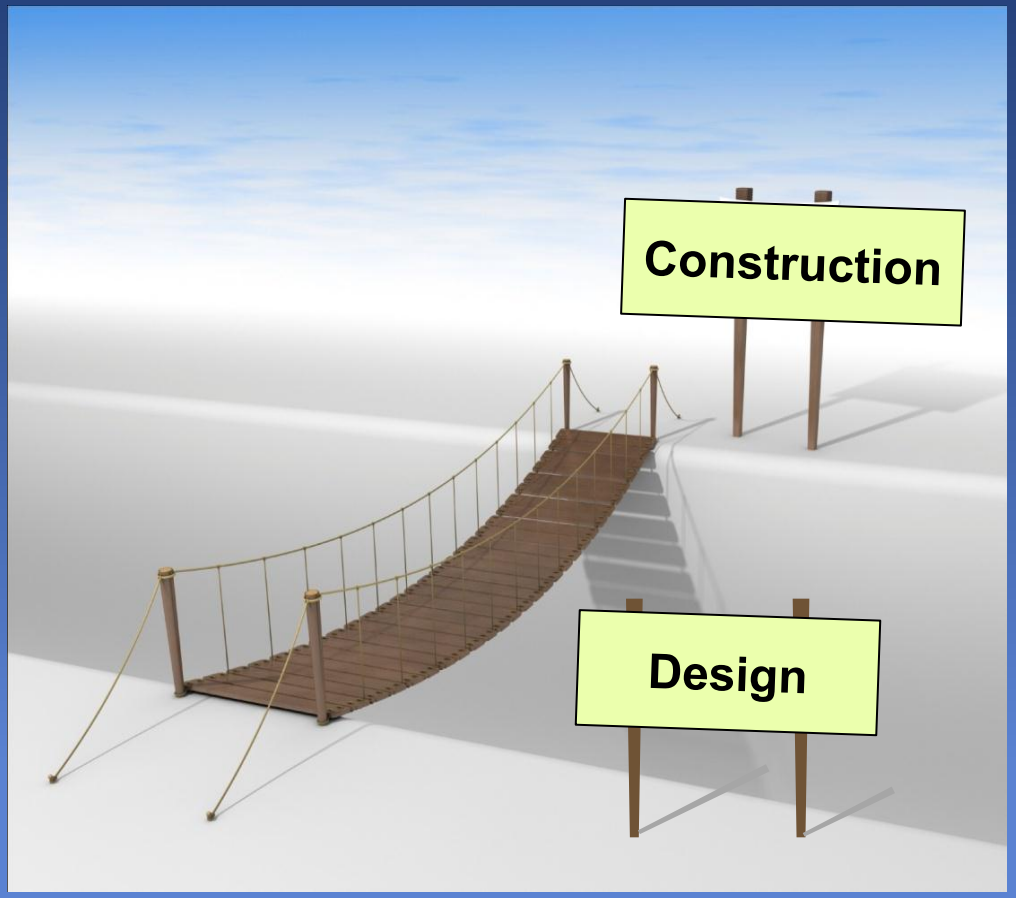
"Don't have time"



"Too complicated"

"It's a pile of…"

RISK MANAGEMENT
-- Bridges the gap



Risk Management team bridges the gap -- project inception to closeout

OVERVIEW OF RISKS FACING CHSRA

I. Business Risk
   a. Variability in the revenues - Ridership and Revenue
   b. Variability in costs - Operations and Maintenance

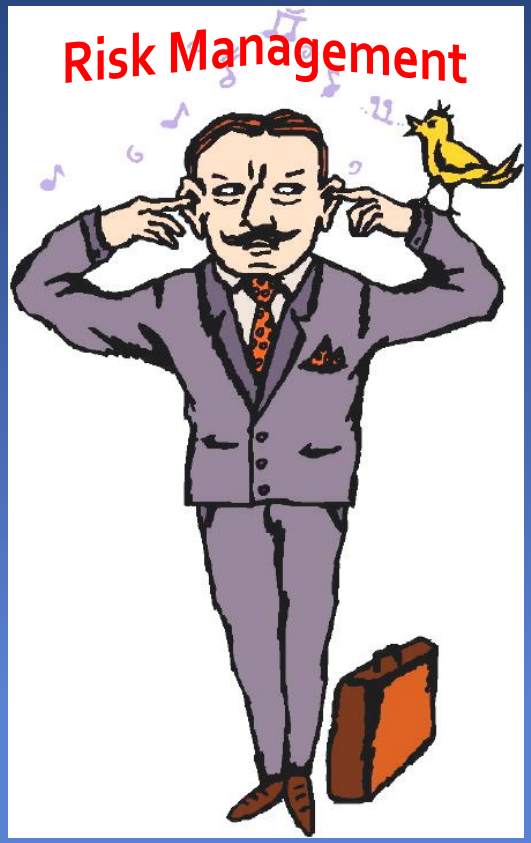
II. Investment Risk
   a. Staffing and organizational structure
   b. Environmental approvals
   c. Stakeholder support
   d. Right-of-Way
   e. Third-Party Agreements

III. Finance and Funding Risk

CHSRA RISK MANAGEMENT PROGRAM -- Ongoing and Coming Attractions

- Update (ongoing) the Risk Management Plan to fully comply with SB 1029 requirements
- Expand the use of quantitative risk management analyses and integrate risk-based estimating practices
- Expand the use schedule risk analyses
- Provide forecasting, budget, and contingency risk analyses
- Roll out risk management information system
- Move towards enterprise risk management, integrating operational, hazard, strategic, and financial risk management
- Facilitate risk-driven decision making

CULTURAL SHIFT



DISCUSSION

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